UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,161	11/19/2003	Kazuo Konabe	FL0247USNA	6759

23906 7590 12/01/2005

E I DU PONT DE NEMOURS AND COMPANY
LEGAL PATENT RECORDS CENTER
BARLEY MILL PLAZA 25/1128
4417 LANCASTER PIKE
WILMINGTON, DE 19805

EXAMINER	
HU, HENRY S	

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/717,161	KONABE, KAZUO	
	Examiner	Art Unit	
	Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *IDS of May 11, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☒ Claim(s) *2 and 7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2 pages*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to two IDS' filed on February 19, 2004 and May 11, 2005 respectively. **Claims 1-9 are now pending** with two independent claims (Claims 1 and 6). An action follows.

Specification

2. The disclosure is objected to because of the following informalities:

On **page 3** at line 18, **page 5** at line 11 and may be throughout specification, recitation of "perfluoroalkylethylene" for PFBE monomer may be improper and it is suggested changing to a clear structural language such as "**perfluoro(alkylethylene)**" or "**(perfluoroalkyl)ethylene**". Otherwise, it may be confusing to one having ordinary skill in the art. It is noted that "perfluoro(alkylethylene)" is quite different from "(perfluoroalkyl)ethylene".

Claim Objections

3. Claims 2 and 7 are objected to because of the following informalities:

On **Claim 2** at line 6 and **Claim 7**, recitation of "perfluoroalkylethylene" for PFBE monomer may be improper. The Examiner suggests changing to a clear and structural language such as "**perfluoro(alkylethylene)**" or "**(perfluoroalkyl)ethylene**". Otherwise, it may be

confusing to one having ordinary skill in the art. It is noted that "perfluoro(alkylethylene)" is quite different from "(perfluoroalkyl)ethylene".

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. *The limitation of parent* ***Claim 1*** *relates to* ***a binder for electrode materials*** *which comprises* ***tetrafluoroethylene-based polymer fine particles*** *having an average particle size of not more than about 0.20 μm and having a standard specific gravity of not more than about 2.20, wherein a mixture prepared from said fine particles with about* ***17% by weight of***

the total mixture of ***an extrusion coagent,*** *when subjected to the measurement of an extrusion pressure by a rheometer, exhibits under the conditions of a draw ratio of 100 to 1 and an extrusion speed of 18 +/- 2 mm/min, an extrusion pressure of not less than about 220 kg/cm^2. Other parent* ***Claim*** *7 relates to a process of making a binder of parent Claim 1. See other limitations of dependent* ***Claims 2-5 and 7-9.***

6. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura et al. (US 4,197,366 or its equivalent JP-55049862 A) in view of Finlay et al. (US 4,115,481).

Regarding the limitation of parent **Claim 1** (product made) and its process **Claim 6**, **Tamura** et al. in each of US and JP patents have disclosed a process of making a positive mass for a non-aqueous electrolyte cell, the composition comprises (A) manganese dioxide powder, (B) carbon powder and (C) a PTFE powder (column 1, line 6-14; column 2, line 50-56; column 3, line 32-36). **The particles of PTFE powder are small to be in the sizes up to 30 μm so that it can be uniformly mixed with the manganese dioxide powder and carbon powder,** uniform dielectric resistance on the positive mass can be thereby obtained (column 2, line 66 – column 3, line 4). With respect to the claimed average particle size being not more than 0.20 μm, it is found the PTFE powder with a very low average particle size at **0.01 μm** is used in working Example #3 by Tamura (column 5, line 44-45).

7. **The use of PTFE powder as a binder** to bind manganese dioxide powder and carbon powder is necessary either when it is not using the shape of the positive mass packed in or when

it is under pressure (column 3, line 32-36). In a close examination, Tamura is silent about adding an extrusion coagent in the positive mass. **Finlay** et al. teach that a mixture of **unsaturated coagent along with other additives such as metal oxide and carbon black powder** can be mixed with fluorinated polymer composition. By doing so, such a composition can be effectively formed into shaped structures by extrusion or molding (column 4, line 27-41).

In light of the fact that **fluorinated polymer compositions** produced by both involved references are containing fundamentally the same components including fluoropolymer, metal oxide and carbon powder, one having ordinary skill in the art would have therefore found it obvious to **modify Tamura's positive mass made from PTFE, manganese oxide and carbon powder by including unsaturated coagent** as taught by Finlay. By doing so, one advantage is that such a composition can be effectively formed into other shaped structures by extrusion or molding. Therefore, a better and more diversified final product can be obtained.

8. Regarding **Claims 2, 4, 7 and 9**, although homopolymer type "PTFE" is preferably used by Tamura, it may include its copolymers known in the art from the language of "polytetrafluoroethylene". Therefore, some of such PTFE polymers may carry the claimed SSG at 2.12-2.19.

Regarding **Claim 3 and 8**, the particles of PTFE powder are small with the sizes **up to 30 μm** so that it can be uniformly mixed with manganese dioxide powder and carbon powder, the

positive mass with uniform dielectric resistance can be thereby obtained (column 2, line 66 – column 3, line 4).

Regarding the extrusion pressure being 270 kg/cm^2 or higher in **Claim 5**, Finlay discloses that the measurement of **die swell** is at a standard extrusion rate of **400 g/min** (column 6, line 58-63; column 6, line 5-18). However, **die swell becomes higher with a higher extrusion rate** (for instance, with a higher extrusion pressure).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a binder (useful for making electrode materials) comprising a tetrafluoroethylene based polymer and an extrusion coagent:

US Patent No. 4,722,773 to Plowman et al. only discloses the preparation of a binder for electrode materials by combining PTFE or its PTFE copolymer with carbon black (column 5, line 17-25; column 6, line 13-22). However, **no extrusion coagent is disclosed or suggested as additive to this composition for use in extrusion or molding**.

US Patent No. 4,211,868 to Erdman only discloses the preparation of making a fluoroelastomer gelling agent such as **HFTAIC** to be useful as coagent for gelling various types of fluoroelastomer (column 4, line 5-65; column 3, line 59-67; column 1, line 10-28).

Fluoroelastomer blends made with this gelling agent exhibit improved extrusion and milling (column 1, line 16-28). However, **such a gelling agent is not disclosed or suggested using it to make a binder composition for use in extrusion or molding electrode material.**

10. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, art unit 1713, USPTO

November 27, 2005

DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700